

IN THE SPECIFICATION

Please delete the title in its entirety and insert - - A Method for Annealing a Dielectric Film - - therein.

REMARKS

Specification

Title

The Examiner has objected to the Title of the Invention as not being descriptive. Applicant submits herewith an amended Title of the Invention which is clearly indicative of the invention to which the claims are directed.

Claim 32 Rejection

The Examiner has objected to claim 32 as failing to provide adequate support in the specification. Applicant respectfully submits that support for claim 32 can be found in the specification at least at page 17 line 24- page 8 line; page 20 line 10-14. Additionally, claim 32 is an originally filed claim and as such is to be taken as part of the original disclosure of the present invention. Thus, claim 32 can find sufficient support in the description so that the meaning of claim 32 is ascertainable. Applicant, therefore, respectfully request the removal of the objection to claim 32.

Claim Rejections - 35 U.S.C. §102

The Examiner has rejected claims 1, 2, 4-12, 15, 17 and 21-23 under 35 U.S.C. §102(b) as being anticipated by Carl et al. (US Patent No 5,468,687). It is the Examiners position that Carl et al. teaches a method of annealing a dielectric layer as claimed including forming a dielectric layer on a substrate; generating an active atomic species in a first chamber; and exposing the dielectric layer to the active atomic species wherein the substrate is located in the second chamber separate from the first chamber while exposing the dielectric layer to active atomic species.

It is Applicants understanding that Carl et al. fails to teach or render obvious Applicant's invention as claimed. Applicant claims a method of generating active atomic species in a first chamber and then exposing a dielectric layer to the active atomic species in a second chamber where the second chamber is different from the first chamber. As such Applicant teaches and claims to form active atomic species in a chamber separate from the chamber in which the dielectric layer is annealed. In this way the dielectric layer can be exposed to highly active atomic species without being exposed to the harmful plasma used to generate the active atomic species.

Applicant understands Carl et al. to teach a plasma enhanced oxidation anneal of a dielectric layer. In the plasma enhanced oxidation process of Carl et al. the plasma is generated in the same chamber in which the substrate being processed is located. As such Carl et al. does not teach annealing a dielectric layer by forming active atomic species in a chamber different than the chamber in which the substrate being annealed is located. As such and Carl et al. fails to teach Applicant's invention as claimed in claims 1, 2, 4-12, 15, 17 and 21-23.

The Examiner has rejected claims 1-15, 17, 18 and 20-23 under 35 U.S.C. §102(e) as being anticipated by Hasegawa (US Patent No 5,677,015). It is the Examiners position that Hasegawa teaches a method of annealing a dielectric layer as claimed including forming a dielectric layer on a substrate; generating an active atomic species in a first chamber; and exposing the dielectric layer to active atomic species wherein the substrate is located in a second chamber separate from the first chamber while exposing the dielectric layer to active atomic species.

It is Applicants understanding that Hasegawa fails to teach Applicant's invention as claimed at least because Hasegawa fails to teach forming active atomic species in a chamber separate from the chamber in which the substrate to be annealed with the atomic species is located. That is, Hasegawa fails to teach forming active atomic species in one chamber and then providing the active atomic species to a second chamber to anneal a dielectric film contained therein. It is Applicants understanding that Hasegawa, like Carl et al., teaches a plasma treatment of a dielectric layer wherein the plasma is created in the same chamber in which the substrate to be annealed is located (Col. 6 line 60 – Col. 7 line 8). As such Hasegawa like Carl et al. fails to teach generating active atomic species in one chamber and then annealing the substrate with the active atomic species in a second different chamber.

As such for the above mentioned reasons it is Applicants understanding that Hasegawa clearly fails to teach Applicant's invention as claimed in claims 1-15, 17, 18, and 20-23. Applicant therefore respectfully request the removal of 35 U.S.C. §102(e) rejections of claims 1-15, 17, 18, and 20-23 based upon the reference of Hasegawa.

Claim Rejections – 35 U.S.C. §103

The Examiner has rejected dependent claims 3, 13, 18 and 20 under 35 U.S.C. §103(a) as being unpatentable over Hasegawa or Carl et al. in view of Slomowitz. It is the Examiners position that although neither Carl et al. nor Hasegawa utilize a microwave source to generate the plasma it is the Examiner position that it would be obvious to someone of ordinary skill in the art to utilize the microwave generator or Slomowitz to generate the plasma used in Carl et al. and Hasegawa. It is Applicants understanding that both Hasegawa and Carl et al. teach a plasma anneal and as such form a plasma (ionized radicals) in the same chamber as which the substrate being anneal is located. Thus, combining the microwave plasma generator of Slomowitz with the process of either Carl et al. or Hasegawa would teach to form a microwave plasma in the chamber in which the substrate to be annealed is located. Thus, the combination of Slomowitz with either Carl et al. or Hasegawa still fails to teach forming active atomic species in a chamber different than the chamber in which the substrate to be annealed by the active atomic species is located.

As such the cited references clearly fail to teach or render obvious Applicant's invention as claimed in claims 13, 13, 18 and 20. Applicant, therefore, respectfully request the removal of 35 U.S.C. §103 rejections of claims 3, 13, 14, 16, 18 – 20, and 24-32 and seeks an early allowance of these claims.

If there are any additional charges, please charge Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

Date: 1/27/00

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